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| FORM PTO-1390 (Modified) U.S. PATENT AND TRADEMARK OFFICE; U.S. DEPARTMENT OF COMMERCE<br>(REV. 7-2005)   |  | ATTORNEY'S DOCKET NUMBER<br>873.0115.U1(US)                   |
| TRANSMITTAL LETTER TO THE UNITED STATES<br>DESIGNATED/ELECTED OFFICE (DO/EO/US)<br>CONCERNING A SUBMISSION UNDER 35 U.S.C. 371  |  | U.S. APPLICATION NO. (If known, see 37 CFR 1.5)<br>10/523,167 |
| INTERNATIONAL APPLICATION NO.<br>PCT/IB2003/002088  | INTERNATIONAL FILING DATE<br>29 May 2003 | PRIORITY DATE CLAIMED<br>1 July 2002                          |
| TITLE OF INVENTION<br>Method and Apparatus to Establish Constellations for Imperfect Channel State Information at a Receiver  |  |   |
| APPLICANT(S) FOR DO/EO/US<br>Mohammad Jaber BORRAN, Ashutosh SABHARWAL, Behnaam AAZHANG   |  |   |
| Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:   |  |   |
| <ol style="list-style-type: none"> <li>1. <input type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a submission under 35 U.S.C. 371.</li> <li>2. <input checked="" type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a submission under 35 U.S.C. 371.</li> <li>3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.</li> <li>4. <input type="checkbox"/> The US has been elected (Article 31).</li> <li>5. <input type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c)(2)) <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> has been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto.</li> <li>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</li> </ol> </li> <li>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)) <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> have been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). (2)</li> <li>10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).</li> <li>11. <input type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409).</li> <li>12. <input type="checkbox"/> A copy of the International Search Report (PCT/ISA/210).</li> </ol> <p>Items 13 to 23 below concern document(s) or information included:</p> <ol style="list-style-type: none"> <li>13. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>14. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>15. <input type="checkbox"/> A <b>FIRST</b> preliminary amendment.</li> <li>16. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li>17. <input type="checkbox"/> A substitute specification.</li> <li>18. <input type="checkbox"/> A power of attorney and/or change of address letter.</li> <li>19. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 37 CFR 1.821 - 1.825.</li> <li>20. <input type="checkbox"/> A second copy of the published International Application under 35 U.S.C. 154(d)(4).</li> <li>21. <input type="checkbox"/> A second copy of the English language translation of the International Application under 35 U.S.C. 154(d)(4).</li> <li>22. <input type="checkbox"/> Express Mail Label No.</li> </ol> |  |   |

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|  |  |   |  |      |              |         |   |            |                    |        |   |            |    |        |
|--|--|---|--|------|--------------|---------|---|------------|--------------------|--------|---|------------|----|--------|
| U.S. APPLICATION NO (if known, see 37 CFR 1.5)<br><div style="text-align: center;"><b>10/523,167</b></div>   | INTERNATIONAL APPLICATION NO.<br><div style="text-align: center;"><b>PCT/IB2003/002088</b></div> | ATTORNEY'S DOCKET NUMBER<br><div style="text-align: center;"><b>873.0115.U1(US)</b></div>   |  |      |              |         |   |            |                    |        |   |            |    |        |
| 23. Other items or information:<br><div style="text-align: center;">Copy of Notification of Missing Requirements</div>   |  |   |  |      |              |         |   |            |                    |        |   |            |    |        |
| The following fees have been submitted:  |  | <b>CALCULATIONS      PTO USE</b>  |  |      |              |         |   |            |                    |        |   |            |    |        |
| 24. <input type="checkbox"/> Basic national fee ..... \$300  | \$   | \$0.00  |  |      |              |         |   |            |                    |        |   |            |    |        |
| 25. <input type="checkbox"/> Examination fee (37 CFR 1.492(c))<br>If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article<br>as an International Searching Authority. .... \$0<br>All other situations. .... \$200  | \$   | \$0.00  |  |      |              |         |   |            |                    |        |   |            |    |        |
| 26. <input type="checkbox"/> Search fee (37 CFR 1.492(b))<br>If the written opinion of the ISA/US or the International preliminary examination report by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4). . . \$0<br>Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the<br>as an International Searching Authority. .... \$100<br>International Search Report prepared by an ISA other than the US and provided to the<br>previously communicated to the US by the IB. .... \$400<br>All other situations. .... \$500            | \$   | \$0.00  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <b>TOTAL OF 24, 25 and 26 =</b>  |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <input type="checkbox"/> Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) or computer program listing in an electronic medium) (37 CFR 1.492(j)).<br>The fee is \$250 for each additional 50 sheets of paper or fraction thereof.  |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Total Sheets</td> <td style="width: 20%;">Extra Sheets</td> <td style="width: 40%;">Number of each additional 50 or fraction thereof (round up to a whole)</td> <td style="width: 20%;">RATE</td> </tr> <tr> <td style="text-align: center;">- 100 =</td> <td style="text-align: center;">0 /50 =</td> <td style="text-align: center;">0</td> <td style="text-align: center;">x \$250.00</td> </tr> </table>   | Total Sheets   | Extra Sheets  | Number of each additional 50 or fraction thereof (round up to a whole) | RATE | - 100 =      | 0 /50 = | 0 | x \$250.00 | \$                 | \$0.00 |   |            |    |        |
| Total Sheets   | Extra Sheets   | Number of each additional 50 or fraction thereof (round up to a whole)  | RATE   |      |              |         |   |            |                    |        |   |            |    |        |
| - 100 =  | 0 /50 =  | 0   | x \$250.00   |      |              |         |   |            |                    |        |   |            |    |        |
| Surcharge of \$130.00 for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).  |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">CLAIMS</td> <td style="width: 20%;">NUMBER FILED</td> <td style="width: 20%;">NUMBER EXTRA</td> <td style="width: 20%;">RATE</td> </tr> <tr> <td>Total claims</td> <td style="text-align: center;">- 20 =</td> <td style="text-align: center;">0</td> <td style="text-align: center;">x \$50.00</td> </tr> <tr> <td>Independent claims</td> <td style="text-align: center;">- 3 =</td> <td style="text-align: center;">0</td> <td style="text-align: center;">x \$200.00</td> </tr> </table> | CLAIMS   | NUMBER FILED  | NUMBER EXTRA   | RATE | Total claims | - 20 =  | 0 | x \$50.00  | Independent claims | - 3 =  | 0 | x \$200.00 | \$ | \$0.00 |
| CLAIMS   | NUMBER FILED   | NUMBER EXTRA  | RATE   |      |              |         |   |            |                    |        |   |            |    |        |
| Total claims   | - 20 =   | 0   | x \$50.00  |      |              |         |   |            |                    |        |   |            |    |        |
| Independent claims   | - 3 =  | 0   | x \$200.00   |      |              |         |   |            |                    |        |   |            |    |        |
| MULTIPLE DEPENDENT CLAIMS (if applicable) <input type="checkbox"/> + \$360.00  |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <b>TOTAL OF ABOVE CALCULATIONS =</b>   |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. Fees above are reduced by 1/2.   |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <b>SUBTOTAL =</b>  |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| Processing fee of \$130.00 for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i)).  |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <b>TOTAL NATIONAL FEE =</b>  |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40 per property +  |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| <b>TOTAL FEES ENCLOSED =</b>   |  | \$  |  |      |              |         |   |            |                    |        |   |            |    |        |
| 03/15/2006 PKAYPAGH 00000111 10523167<br>01 FC:1617 130.00 DP  |  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Amount to be</td> <td style="width: 20%;">\$</td> </tr> <tr> <td>Amount to be</td> <td>\$</td> </tr> </table> | Amount to be   | \$   | Amount to be | \$      |   |            |                    |        |   |            |    |        |
| Amount to be   | \$   |   |  |      |              |         |   |            |                    |        |   |            |    |        |
| Amount to be   | \$   |   |  |      |              |         |   |            |                    |        |   |            |    |        |

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

- a. ☒ A check in the amount of \$ \$130.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-1924. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

**NOTE:** Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

SEND ALL CORRESPONDENCE TO:

Customer No. 29683  
Harrington & Smith, LLP  
4 Research Drive  
Shelton, CT 06484-6212  
(203) 925-9400

  
SIGNATURE

Gerald J. Stanton

NAME

46,008

REGISTRATION NUMBER

March 7, 2006

DATE

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re U.S. Patent Application of:

Applicant: Borran et al.

U.S. Serial No.: 10/523,167

Filed: January 27, 2005

Title: Method and Apparatus to Establish Constellations for Imperfect  
Channel State Information at a Receiver

Attorney Docket No.: 873.0115.U1(US)

Certificate of Mailing

I hereby certify that the following correspondence:

Transmittal Letter to DO/EO/US

Declaration and Power of Attorney - 2 sets

Copy of Notification of Missing Requirements

Check for \$ 130.00

Self addressed stamped post card

Is being deposited with the United States Postal Service with first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Mail Stop PCT, Alexandria, VA 22313-1450.

Date: 3-7-06

Ann Okrentowich  
Ann Okrentowich



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

|                             |                       |                  |
|-----------------------------|-----------------------|------------------|
| U.S. APPLICATION NUMBER NO. | FIRST NAMED APPLICANT | ATTY. DOCKET NO. |
| 10/523,167                  | Mohammad Jaber Borran | 873.0115.U1(US)  |

INTERNATIONAL APPLICATION NO.

PCT/IB03/02088

I.A. FILING DATE

PRIORITY DATE

05/29/2003

07/01/2002

29683

HARRINGTON & SMITH, LLP  
4 RESEARCH DRIVE  
SHELTON, CT 06484-6212

US ACTION  
DUE DATE 3/10/06  
PAPER DATED 1/10/2006  
OA FINAL 2/10/06  
MSG PT DWG  
APPEAL ISSUE FEE  
OTHER \_\_\_\_\_

CONFIRMATION NO. 8220

371 FORMALITIES LETTER



\*OC000000017761144\*

Date Mailed: 01/10/2006

### NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as a Designated / Elected Office (37 CFR 1.495).

- Copy of the International Application filed on 01/27/2005
- Copy of the International Search Report filed on 01/27/2005
- Copy of IPE Report filed on 01/27/2005
- Information Disclosure Statements filed on 01/27/2005
- U.S. Basic National Fees filed on 01/27/2005

The applicant needs to satisfy supplemental fees problems indicated below.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the International application number and international filing date.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.492(h) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.

## SUMMARY OF FEES DUE:

Total additional fees required for this application is \$130 for a Large Entity:

- \$130 Surcharge.

RECEIVED

JAN 17 2006

HARRINGTON &amp; SMITH, LLP

ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE OR BY 32 MONTHS FROM THE PRIORITY DATE FOR THE APPLICATION,

**WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.**

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

*A copy of this notice **MUST** be returned with the response.*

FREDERICK SMITH

Telephone: (703) 308-9140 EXT 210

**PART 1 - ATTORNEY/APPLICANT COPY**

| U.S. APPLICATION NUMBER NO. | INTERNATIONAL APPLICATION NO. | ATTY. DOCKET NO. |
|-----------------------------|-------------------------------|------------------|
| 10/523,167                  | PCT/IB03/02088                | 873.0115.U1(US)  |